

Michelle Lujan Grisham Governor

Howie C. MoralesLieutenant Governor

NEW MEXICO ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

1190 Saint Francis Drive / PO Box 5469 Santa Fe, NM 87502-5469 Phone (505) 827-2900 Fax (505) 827-2965 www.env.nm.gov



James C. Kenney
Cabinet Secretary

Jennifer J. Pruett
Deputy Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

January 15, 2021

Kevin Bertrand, Sr. Manager Nutrien Vado-Agro 5296 Harvest Lake Drive Loveland, CO 80538

RE: UIC General Discharge Permit, DP-1920, Nutrien Vado-Agro

Dear Mr. Bertrand:

The New Mexico Environment Department (NMED) hereby provides notice to Nutrien Ag Solutions, Inc. of the proposed approval of Ground Water General Discharge Permit, DP-1920, (copy enclosed), pursuant to Subsection H of 20.6.2.3108 NMAC. NMED will publish notice of the availability of the draft Discharge Permit in the near future for public review and comment and will forward a copy of that notice to you.

Prior to making a final ruling on the proposed Discharge Permit, NMED will allow 30 days from the date the public notice is published in the newspaper for any interested party, including the Discharge Permit applicant, i.e., yourself, to submit written comments and/or a request a public hearing. A hearing request shall set forth the reasons why a hearing is requested. NMED will hold a hearing in response to a timely hearing request if the NMED Secretary determines there is substantial public interest in the proposed Discharge Permit.

Please review the enclosed draft Discharge Permit carefully. Please be aware that this Discharge Permit may contain conditions that require the permittee to implement operational, monitoring or closure actions by a specified deadline.

NMED is taking all necessary precautions to reduce the spread of COVID-19. Given the current public health emergency, all monitoring and permit required activities must by conducted in accordance with the Governor's current Executive Orders and Public Health Orders. Please help to keep New Mexicans safe by visiting the New Mexico Department of Health's website to learn

Kevin Bertrand January 15, 2021 Page 2 of 2

how you can play a role in stopping the spread of COVID-19. That website is cv.nmhealth.org. If you believe the current COVID-19 restrictions impact your ability to safely complete one or more permit required tasks, please include this information with your submittals.

Please submit written comments or a request for hearing to my attention at the address above or via email to andrewc.romero@state.nm.us. If NMED does not receive written comments or a request for hearing during the public comment period, the draft Discharge Permit will become final.

Thank you for your cooperation during the review process. Feel free to contact me with any questions at (505) 660-8624.

Sincerely,

Andrew Romero Environmental Scientist

Encl: Draft General Discharge Permit, DP-1920

cc: Steve Meninger, smeninger@rubikenv.com



NEW MEXICO ENVIRONMENT DEPARTMENT GROUND WATER QUALITY BUREAU

UNDERGROUND INJECTION CONTROL



GENERAL DISCHARGE PERMIT

Certified Mail- Return Receipt Requested

Facility Name: NUTRIEN VADO-AGRO, NM FACILITY

Facility Location: 8601 Highway 478 Vado, NM

S20 T25S R3E

Dona Ana County

Legally Responsible Party: NUTRIEN AG SOLUTIONS, INC.

5296 Harvest Lake Drive, Loveland CO 80538

303-261-2982

Remediation Oversight Agency Contact: GWQB - REMEDIATION OVERSIGHT

SECTION Paul Chamberlain

505-827-9669

GWQB - REMEDIATION OVERSIGHT SECTION

Remediation or Injection Plan Identification: STAGE 2 ABATEMENT PLAN MODIFICATION &

WORK PLAN - 2/3/2020

Permitting Action: New DP-1920

PPS Contact Andrew Romero

(505) 660-8624

EFFECTIVE DATE: XX/XX/XXXX TERM ENDS: XX/XX/XXXX

....

Michelle Hunter

Chief, Ground Water Quality Bureau

[Subsection H of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.I]

EFFECTIVE DATE: XX/XX/XXXX

I. UIC GENERAL DISCHARGE PERMIT

The New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) issues this Underground Injection Control General Discharge Permit (UIC Permit) for the subsurface emplacement of additive fluids through a Class V UIC injection well for the purpose of facilitating vadose zone or groundwater remediation. The GWQB issues this UIC Permit to NUTRIEN AG SOLUTIONS, INC. (Permittee) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978 §§74-6-1 through 74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Ground and Surface Water Protection Regulations, 20.6.2 NMAC.

In issuing this UIC Permit, the GWQB has determined that the requirements of Subsection C of 20.6.2.3109 NMAC have been met. The activities authorized by this UIC Permit are principally governed by STAGE 2 ABATEMENT PLAN MODIFICATION & WORK PLAN - 2/3/2020 (Injection Plan), under the authority of GWQB - REMEDIATION OVERSIGHT SECTION, with oversight by the GWQB - REMEDIATION OVERSIGHT SECTION. Compliance with this UIC Permit requires compliance with the terms, requirements, and conditions of the Injection Plan. The term of this UIC Permit shall be no longer than five years from the effective date of this UIC Permit.

The injection activities, the location of the injection site, the type of injection and quantities of additives being used are briefly described as follows:

Injection Activities (summary: including injection well type, number of wells, and injection frequency)

Copy of the Injection Plan Attache	ed (requ	ired): [X

Summary of Injection Plan: Lactoil will be injected into groundwater at depths between 10 and 30 feet beneath the ground surface to remediate nitrate concentrations. Injections will occur at a maximum of 17 locations at and adjacent to the facility (see attached figure).

Injection Site Information

Depth to most shallow groundwater (required): 11 ft

Existing concentration of total dissolved solids (TDS) in groundwater (required): 1,800mg/

L Location (required): 8601 Highway 478, Vado, NM

County (required): Dona Ana

Latitude: 32.115881 Longitude: -106.665424

Map Showing Area of Injection Sites Attached (required):

Additives Being Used (including volumes, manufacturer, and mixing ratios)

A total of 14,790 pounds (1,870 gallons) of Lactoil will be injected during the project. The Lactoil will be mixed with 17,000 gallons of water prior to injection to create an approximate 10% solution. The Lactoil is a soy microemulsion manufactured by JRW Bioremediation, LLC.

Anticipated Precipitation, Dissolution, Adsorption, and Desorption Products

Lactoil is comprised of fermentable carbon sources that stimulate microbial growth, which results in depletion of dissolved oxygen and lowering of the oxidation reduction potential in groundwater. As the system becomes more anaerobic, denitrifying bacteria will use nitrate as the electron acceptor and should reduce nitrate concentrations in the groundwater.

Public Notice Posting Locations

2 inch by 3 inch Newspaper Ad required for Renewal applications.

Newspaper: N/A - This is a modification of existing Stage 2 Abatement Plan

3 inch by 4 inch Newspaper Ad required for New, Modification, and Renewal/Modification applications.

Newspaper: Ad will be placed in the Las Cruces Sun News newspaper

2 feet by 3 feet sign posted for 30 days in a location conspicuous to the public at or near the facility required for New, Modification, and Renewal/Modification applications.

Sign Location: The sign will be posted on front gate at the entrance of the facility.

8.5 inch by 11 inch or larger posted off-site location conspicuous to the public (e.g. public library). Required for New, Modification, and Renewal/Modification applications.

Flyer Location: Posting will be placed in the window or door viewable from outside the library's entrance - Anthony Public Library - 820 Highway 478, Anthony, NM 88021

This UIC Permit consists of the complete and accurate completion of this UIC Permit form as determined by the GWQB.

Issuance of this UIC Permit does not relieve the Permittee of the responsibility to comply with the WQA, WQCC Regulations, and any other applicable federal, state and/or local laws and regulations, such as zoning requirements and nuisance ordinances.

Signatures

Signature must be that of the person listed as the legally responsible party on this application.

I, the applicant, attest under penalty of law to the truth of the information and supporting documentation contained in this application for an Underground Injection Control General Discharge Permit.

Applicant's Signature

Signature:	Kevin Bertrand	Date:	November 19, 2020
Printed Name:	Kevin Bertrand	Title:	Sr. Manager, Remediation

EFFECTIVE DATE: XX/XX/XXXX

II. FINDINGS

In issuing this UIC Permit, GWQB finds:

- 1. The Permittee is injecting fluids so that such injections will move directly or indirectly into groundwater within the meaning of Section 20.6.2.3104 NMAC.
- 2. The Permittee is injecting fluids so that such fluids will move into groundwater of the State of New Mexico which has an existing concentration of 10,000 mg/L or less of TDS within the meaning of Subsection A of 20.6.2.3101 NMAC.
- 3. The Permittee is using a Class V UIC well as described in 20.6.2.5002(B)(5)(d)(ii) NMAC for in situ groundwater remediation by injecting a fluid that facilitates vadose zone or groundwater remediation.
- 4. The Permittee is injecting fluids into groundwater in order to achieve the remediation goals identified in the Injection Plan.

III. AUTHORIZATION TO DISCHARGE

The Permittee is authorized to inject chemical additives into groundwater in accordance with this UIC Permit and the Injection Plan under the oversight of GWQB - REMEDIATION OVERSIGHT SECTION.

[20.6.2.3104 NMAC, Subsection C of 20.6.2.3106 NMAC, Subsection C of 20.6.2.3109 NMAC]

IV. CONDITIONS

The conditions of this UIC Permit shall be complied with by the Permittee and are enforceable by GWQB.

1. The Permittee shall perform remediation activities in accordance with the Injection Plan and shall notify GWQB of any changes prior to making them.

[20.6.2.3107 NMAC]

2. The Permittee shall monitor the injection activities and their effects on groundwater quality as required by the Injection Plan and shall provide GWQB with electronic copies of the required reporting and any pertinent documentation of activities at the site.

[20.6.2.3107.A NMAC, 20.6.2.3109.A NMAC]

EFFECTIVE DATE: XX/XX/XXXX

3. If the GWQB or the Permittee identifies any failure of the Injection Plan or this UIC Permit to comply with 20.6.2 NMAC not specifically noted herein, GWQB may require the Permittee to

submit a corrective action plan and a schedule for completion of corrective actions to address

the failure.

Additionally, the GWQB may require the Permittee to submit a proposed modification to the

Injection Plan, this UIC Permit, or both.

[20.6.2.3107.A NMAC, 20.6.2.3109.E NMAC]

4. ADDITIONAL MONITORING REQUIREMENTS – (RESERVED) - Placeholder for any added

monitoring and reporting requirements.

5. TERMINATION - Within 30 days of completion of activities authorized by this UIC Permit the

Permittee shall submit a closure report and a request to terminate the UIC Permit to the GWQB

for its approval. The closure report shall identify how the injection well(s) was (were) closed in

accordance with the Injection Plan. The Permittee shall provide GWQB - REMEDIATION

OVERSIGHT SECTION with a copy of this closure report.

[20.6.2.5005 NMAC, 19.27.4 NMAC]

6. INSPECTION and ENTRY – The Permittee shall allow a representative of the NMED to inspect the

facility and its operations subject to this UIC Permit and the WQCC regulations. The GWQB

representative may, upon presentation of proper credentials, enter at reasonable times upon or

through any premises in which a water contaminant source is located or in which are located any

records required to be maintained by regulations of the federal government or the WQCC. The

Permittee shall allow the GWQB representative to have access to, and reproduce for their use,

any copy of the records, and to perform assessments, sampling or monitoring during an

inspection for the purpose of evaluating compliance with this UIC Permit and the WQCC

regulations.

Nothing in this UIC Permit shall be construed as limiting in any way the inspection and entry

authority of GWQB under the WQA, the WQCC Regulations, or any other local, state, or federal

regulations.

[20.6.2.3107.D NMAC, NMSA 1978, §§ 74-6-9.B and 74-6-9.E]

NUTRIEN VADO-AGRO, NM FACILITY, DP-1920

EFFECTIVE DATE: XX/XX/XXXX

7. MODIFICATIONS and/or AMENDMENTS — In the event the Permittee proposes a change to the injection plan that would result in a change in the volume injected; the location of the injections;

or the concentration of the additives being injected by the facility, the Permittee shall notify GWQB prior to implementing such changes. The Permittee shall obtain approval (which may

require modification of this UIC Permit) by GWQB prior to implementing such changes.

[20.6.2.3107.C NMAC, 20.6.2.3109.E and G NMAC]

8. COMPLIANCE with OTHER LAWS – Nothing in this UIC Permit shall be construed in any way as

relieving the Permittee of the obligation to comply with all applicable federal, state, and local

laws, regulations, permits, or orders.

[NMSA 1978, § 74-6-5.L]

9. PERMIT FEES – Payment of permit fees is due at the time of UIC Permit approval. Permit fees

shall be paid in a single payment remitted to GWQB no later than 30 days after the UIC Permit

effective date.

Permit fees are associated with issuance of this UIC Permit. Nothing in this UIC Permit shall be

construed as relieving the Permittee of the obligation to pay all permit fees assessed by GWQB.

A Permittee that ceases injecting or does not commence injecting during the term of the UIC

Permit shall pay all permit fees assessed by GWQB. An approved UIC Permit shall be suspended

or terminated if the facility fails to remit a payment by its due date.

[20.6.2.3114.F NMAC, NMSA 1978, § 74-6-5.K]



STAGE 2 ABATEMENT PLAN MODIFICATION

Nutrien Ag Solutions, Inc. Former Agriliance Facility 8601 Highway 478 Vado, New Mexico

February 3, 2020

Submitted to:

Paul Chamberlain
New Mexico Environmental Department
Remediation Oversight Section
1190 S. Saint Francis Drive
Santa Fe, New Mexico 87505

Prepared for:

Nutrien Ag Solutions, Inc. 5296 Harvest Lake Drive Loveland, Colorado 80538

Prepared by:

Rubik 320 Flint Street Reno, Nevada 89501

Reviewed by:

Todd Leonard Principal

Prepared and Approved by:

Stephen A. Meninger, PG Senior Geologist

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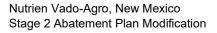
Figure 1	Vicinity Map
Figure 2	Site Map
Figure 3	Historical Soil Boring and Cross Section Location Map
Figure 4	Geologic Cross Section A-A'
Figure 5	Groundwater Analytical Results – December 2019
Figure 6	Proposed Injection Locations

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Monitoring Well Construction Details
Historical Groundwater Elevation and Analytical Data
Lactoil Injection Monitoring Summary
Historical Soil Sampling Analytical Results

APPENDICES

Appendix A	Graphs of COC Concentrations and Depth to Water over Time
Appendix B	Injection Product Information Sheet



1.0 INTRODUCTION

On behalf of Nutrien Ag Solutions, Inc. (Nutrien), Rubik developed this Stage 2 Abatement Plan Modification for the former Agriliance facility located at 8601 Highway 478 in Vado, New Mexico (**Figure 1**). The plan modification was proposed by Nutrien in an October 10, 2019 meeting with the New Mexico Environmental Department (NMED) and was developed in accordance with New Mexico Administrative Code (NMAC) Section 20.6.2.4000.

1.1 Objective

The objective of this project is to reduce nitrate concentrations in the groundwater.

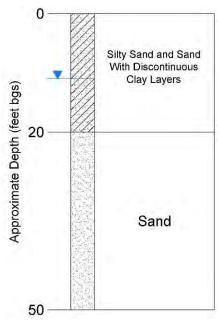
2.0 SITE DESCRIPTION

The facility has operated as a retail distribution of bulk dry and liquid fertilizers since the mid-1990s. The current and former site features are depicted on **Figure 2**.

3.0 GEOLOGY AND HYDROGEOLOGY

3.1 Geology

The geology beneath the site is summarized below:



Historical soil borings and a geologic cross section path are shown on **Figure 3** and the geologic cross section is presented as **Figure 4**.

3.2 Hydrogeology

In December 2019, the depth to groundwater beneath the site was approximately 11 feet below the ground surface (bgs). Groundwater beneath the site flows to the southeast at 0.001 feet/foot. Well construction details are summarized in **Table 1** and historical groundwater elevations are summarized in **Table 2**.



4.0 ABATEMENT HISTORY

Groundwater monitoring and sampling began at the site in 2000 and nitrate as nitrogen (-N) concentrations have continued to exceed the NMED standard of 10 milligrams per liter (mg/L). Monitoring well locations are shown on **Figure 2** and historical groundwater monitoring and sampling data is summarized on **Tables 2** and **3**.

In 2009, soil samples were collected across the site and nitrate-N concentrations exceeded the current NMED soil screening level of 425 milligrams per kilogram (mg/kg) near the load-out areas north and south of the dry fertilizer warehouse (AMEC, 2009a). In late 2009, soil samples were collected following a spill, and nitrate-N concentrations exceeded the standard near the northeast side on the scale (AMEC, 2009b). Historical soil sampling locations are shown on **Figure 3** and the analytical results are summarized in **Table 4**.

In 2010, excavations were performed between 4 and 8 feet deep at the locations shown on **Figure 3** to remove soil with nitrate concentrations exceeding the standard. Soil removal was limited due to the locations of utilities, structures, and railroad tracks (AMEC, 2011). Wells MW-1 and MW-3 were also replaced in 2010 because they were damaged.

In March 2015, well MW-2 was replaced due to decreasing groundwater elevations and to have a monitoring well screened over the same interval as the injections. A solution of Lactoil and water was injected between 15 and 35 feet bgs upgradient of replacement well MW-2A to decrease nitrate-N concentrations in groundwater (Rubik, 2015). Since the groundwater injections, nitrate-N concentrations in well MW-2A have decreased to near or below the NMED standard.

The nitrate-N concentrations during the most recent December 2019 sampling event are shown on **Figure 5**. Graphs depicting historical nitrate-N concentrations and depth to groundwater over time are included as **Appendix A**.

5.0 PROPOSED ABATEMENT PLAN MODIFICATION

Based on the improved groundwater quality in the vicinity of well MW-2A following the 2015 injections, the abatement plan will be expanded to include injections upgradient of wells MW-1A, MW-4, MW-7A, and MW-9 where nitrate-N concentrations exceed the standard. Additionally, wells MW-1A, MW-4, MW-7A, and MW-9 will be destroyed and replaced by wells with 20-foot screen intervals to account for the proposed 20-foot injection interval. Well MW-8 will also be replaced because it is damaged and has not been sampled since 2012. The proposed well and injection locations are shown on **Figure 6**.

5.1 Permitting

Permits for the injection borings and monitoring wells will be obtained from the New Mexico Office of the State Engineer (NMSE) prior to field activities. The NMED and NMSE will be notified at least 48 hours prior to field activities. In accordance with NMAC 20.6.2.1201, a Notice of Intent (NOI) to perform groundwater injections will be submitted to the NMED for approval and a discharge permit will be obtained prior to field activities.



5.2 Public Notice

Public notice of the Stage 2 Abatement Plan Modification will be performed in accordance with NMAC 20.6.2.4108.

5.3 Health and Safety

A site-specific Health and Safety Plan (HASP) will be reviewed and signed by all field personnel, including subcontractors, prior to work initiation. The HASP will identify potential health and safety hazards for each phase of site work and include requirements and procedures for protection. The HASP will be maintained onsite during the field activities.

5.4 Utility Clearance

New Mexico 811 will be notified at least 48 hours in advance of subsurface activities to identify underground utilities. A private utility locator will also perform a geophysical survey in the vicinity of each drilling location to identify potential underground utilities or other subsurface obstructions. If necessary, a hand auger will be advanced to 5 feet bgs before drilling to manually clear the location.

5.5 Monitoring Well Replacement

5.5.1 Well Destruction

Wells MW-1A, MW-4, MW-7A, MW-8 and MW-9 will be destroyed in accordance with NMSE requirements. The wells will be destroyed by removing the concrete well pad and over drilling the well casing to 1 foot below the installed depth (approximately 21 feet bgs). The boring will be tremie grouted with neat cement to approximately 5 feet bgs. The remaining annulus will be filled with native soil obtained onsite.

5.5.2 Replacement Well Construction

Wells MW-1R, MW-4R, MW-7R, MW-8R, and MW-9R will be constructed of 2-inch diameter Schedule 40 PVC casing with 20 feet of 0.010-inch slotted screen installed between 10 and 30 feet bgs. The wells will be installed approximately 10 feet away from the wells they are replacing locations shown on **Figure 6** using a truck-mounted hollow stem auger drilling rig. During drilling, soil cores will be collected every 5 feet and logged in the field using the Unified Soil Classification System. After reaching the maximum extent of drilling (30 feet bgs), the augers will be removed in stages as the annular space will be backfilled as described below.

The annular space between the borehole wall and the well screen in all wells will be backfilled with a silica sand filter pack to approximately 2 feet above the top of the well screen. A 2-foot thick hydrated bentonite pellet seal will be installed above the filter pack. A neat cement sanitary seal will extend from the top of the bentonite seal to approximately 1 feet bgs. The wells will be completed with a flush-mounted traffic-rated well box and the remaining annular space will be backfilled with the concrete for the well pad.



5.5.3 Well Development

The replacement wells will be developed a minimum of 48 hours after installation by a combination of bailing, surging, and pumping. The total well depth, depth to water, temperature, pH, specific conductance, dissolved oxygen, and oxygen reduction potential will be measured prior to, and periodically during, development. Well development will continue until a minimum of five casing volumes of water have been removed and water quality parameters have stabilized.

5.5.4 Well Survey

The location, ground surface elevation, and top of casing elevation of all the wells in the monitoring network will be measured by a New Mexico-licensed Professional Land Surveyor.

5.6 Groundwater Injections

5.6.1 Injection Solution

The injection solution will consist of water and Lactoil®, which is manufactured by JRW Bioremediation, LLC. Lactoil is comprised of fermentable carbon sources that stimulate microbial growth, which results in in depletion of dissolved oxygen and lowering of the oxidation reduction potential in groundwater. As the system becomes more anaerobic, denitrifying bacteria will use nitrate as the electron acceptor and should reduce nitrate concentrations in the groundwater. The product information sheet for Lactoil is included as **Appendix B**.

5.6.2 Injection Method

The injections will be performed in the groundwater upgradient of replacement wells MW-1R, MW-4R, MW-7R, and MW-9R at the locations shown on **Figure 6**. The temporary injection points will be constructed using a truck-mounted direct push drilling rig. The drilling rods will be advanced to approximately 30 feet bgs, and the rods will be retracted to expose a 5-foot screen. The solution will be injected into the subsurface through the drilling rods and screen. The injections will be completed in four 5-foot intervals between 10 and to 30 feet bgs. After the injections are completed, the borings will be tremie grouted with neat cement through the drilling rods to the approximately 5 feet bgs. The remaining annulus will be filled with native soil obtained onsite.

Based on the COC concentrations in groundwater and underlying hydrogeology, 14,790 pounds (1,870 gallons) of Lactoil will be injected. The Lactoil will be mixed with 17,000 gallons of water to create an approximate 10% solution and a total of 18,870 gallons. The solution will be injected into each area as described below:

- MW-1R 5 borings 9,104 gallons total (2,276 gallons per 5-foot interval)
- MW-4R 4 borings 4,884 gallons total (610 gallons per 5-foot interval)
- MW-7R 3 borings 2,442 gallons total (408 gallons per 5-foot interval)
- MW-9R 5 borings 2,442 gallons total (244 gallons per 5-foot interval)

The solution will be injected into each boring at flow rates up to 5 gallons per minute (gpm). If needed, low pressure (up to 40 psi) will be applied using a specialized well cap and air compressor



to ensure maximum distribution of the substrate to the subsurface without creating preferential flow pathways or flow up the drilling rods.

5.7 Decontamination and Waste Management

Down-hole drilling equipment will be decontaminated prior to drilling each boring and well using high-pressure cleaning equipment. The decontamination rinsate generated during drilling will be placed into 55-gallon United States Department of Transportation approved drums. The drums will be labeled, dated, and staged on site prior to characterization and disposal at an appropriate off-site facility.

6.0 GROUNDWATER MONITORING AND SAMPLING PROGRAM

6.1 Schedule and Frequency

Baseline groundwater samples will be collected from the monitoring well network prior to the injection event. Post-injection samples will be collected on a quarterly basis for two years.

6.2 Groundwater Sampling and Analysis

The depth to water and total well depth will be gauged in the wells prior to purging and sampling. The wells will be purged and sampled in accordance with the low flow protocols (Environmental Protection Agency [EPA], 2002). Temperature, pH, specific conductance, dissolved oxygen, and oxidation reduction potential will be measured periodically during purging and recorded on field sheets. After the parameters stabilize, the low-flow pump and dedicated tubing will be used to collect the sample from a discrete point within the saturated screened interval of the well into laboratory-supplied containers.

The groundwater samples will be immediately labeled, sealed in a plastic bag, logged on the Chain of Custody, transferred to a cooler maintained at approximately 4°Celsius, and submitted to the laboratory. The samples will be analyzed for nitrate-N + nitrite-N by EPA method 353.2, and for parameters to evaluate denitrification conditions including total organic carbon by EPA method 5310, chloride and sulfate by EPA method 300.0, and iron and manganese by EPA method 6010.

7.0 SCHEDULING AND REPORTING

Field activities will be initiated after receiving the NMED's authorization to proceed, securing the permits, submitting a NOI, and notifying the public. A Stage 2 Abatement Summary Report will be submitted to the NMED after completing the field activities. At a minimum, the report will contain:

- Copies of the approved permits and documentation of public notification(s);
- Field notes from the baseline groundwater sampling event;
- Figures and tables summarizing the baseline groundwater analytical results;
- Laboratory analytical report(s), and
- Descriptions of the injection methods and volumes.



The post-injection groundwater sampling results will be reported in subsequent quarterly groundwater monitoring and sampling reports for the site.



8.0 REFERENCES

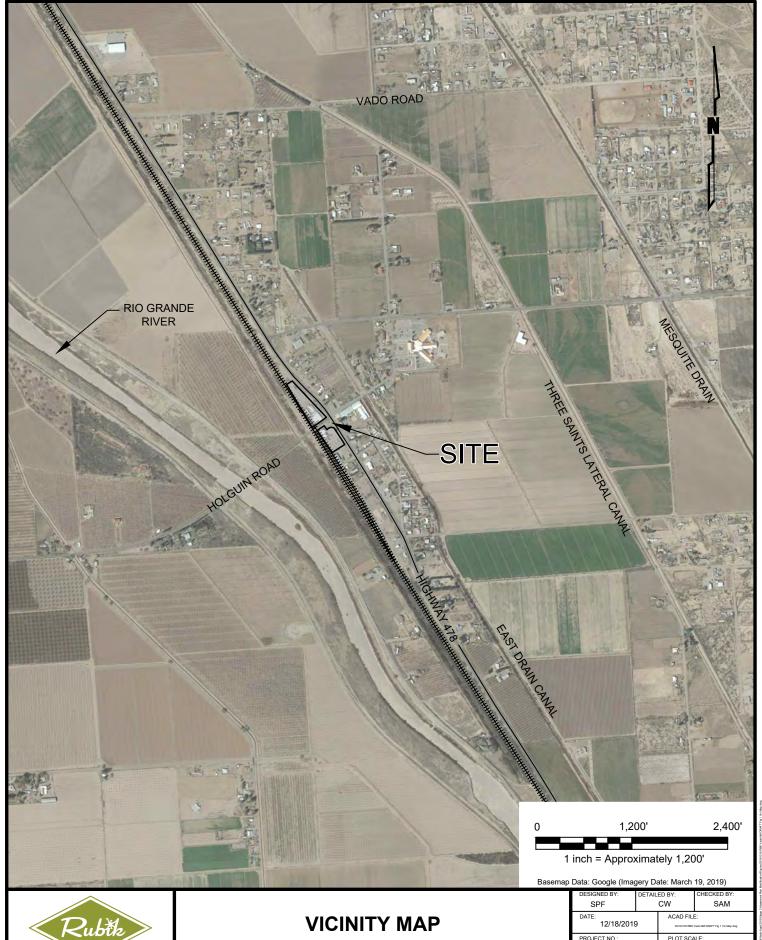
- AMEC, 2009a. Direct Push Soil and Groundwater Investigation, Agriliance, 8601 Highway 478, Vado, New Mexico. April 29.
- AMEC, 2009b. Spill Response 15-day Report, Agriliance, 8601 Highway 478, Vado, New Mexico. September 23.
- AMEC, 2011. Stage 1 Abatement Plan Remediation Activities and Monitoring Well Replacement, Former Agriliance, LLC Distribution Site, 8601 Highway 478, Vado, New Mexico. January 18.
- IT Corp, 2001a. Stage 1 Abatement Plan for Agro Distribution Site, 8601 Highway 478, Vado, New Mexico. July 10.
- IT Corp, 2001b. Final Site Investigation Report for Agro Distribution Site, 8601 Highway 478, Vado, New Mexico. December 19.
- Rubik, 2015. Stage 2 Abatement Status and 2015 First Semi-Annual Groundwater Monitoring and Sampling Report, Former Agriliance Facility, 8601 Highway 478, Vado, New Mexico. November 30.

FIGURES

STAGE 2 ABATEMENT PLAN MODIFICATION

Nutrien Ag Solution, Inc. Vado-Agro, New Mexico

February 2020





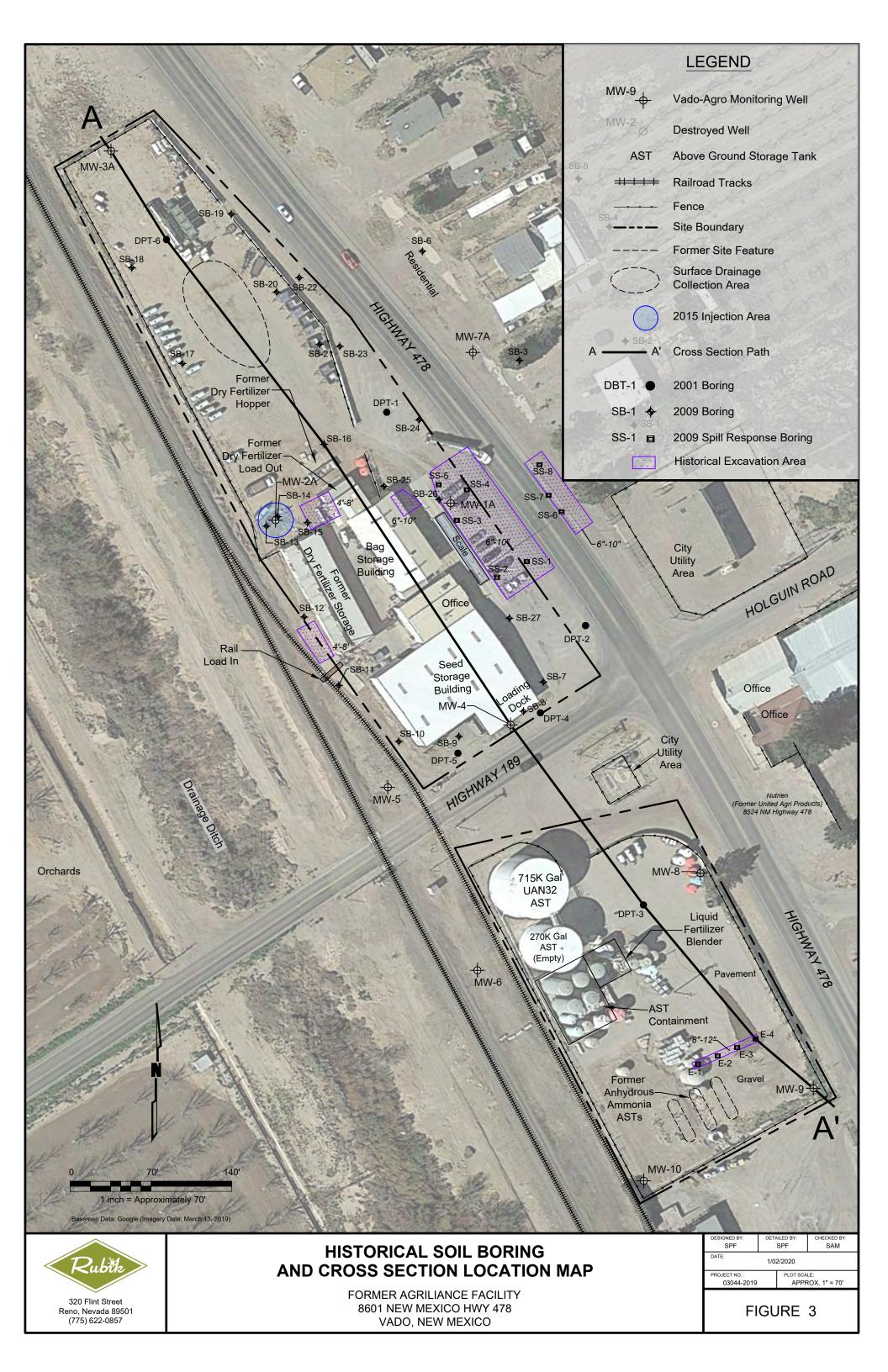
320 Flint Street Reno, Nevada 89501 (775) 622-0857

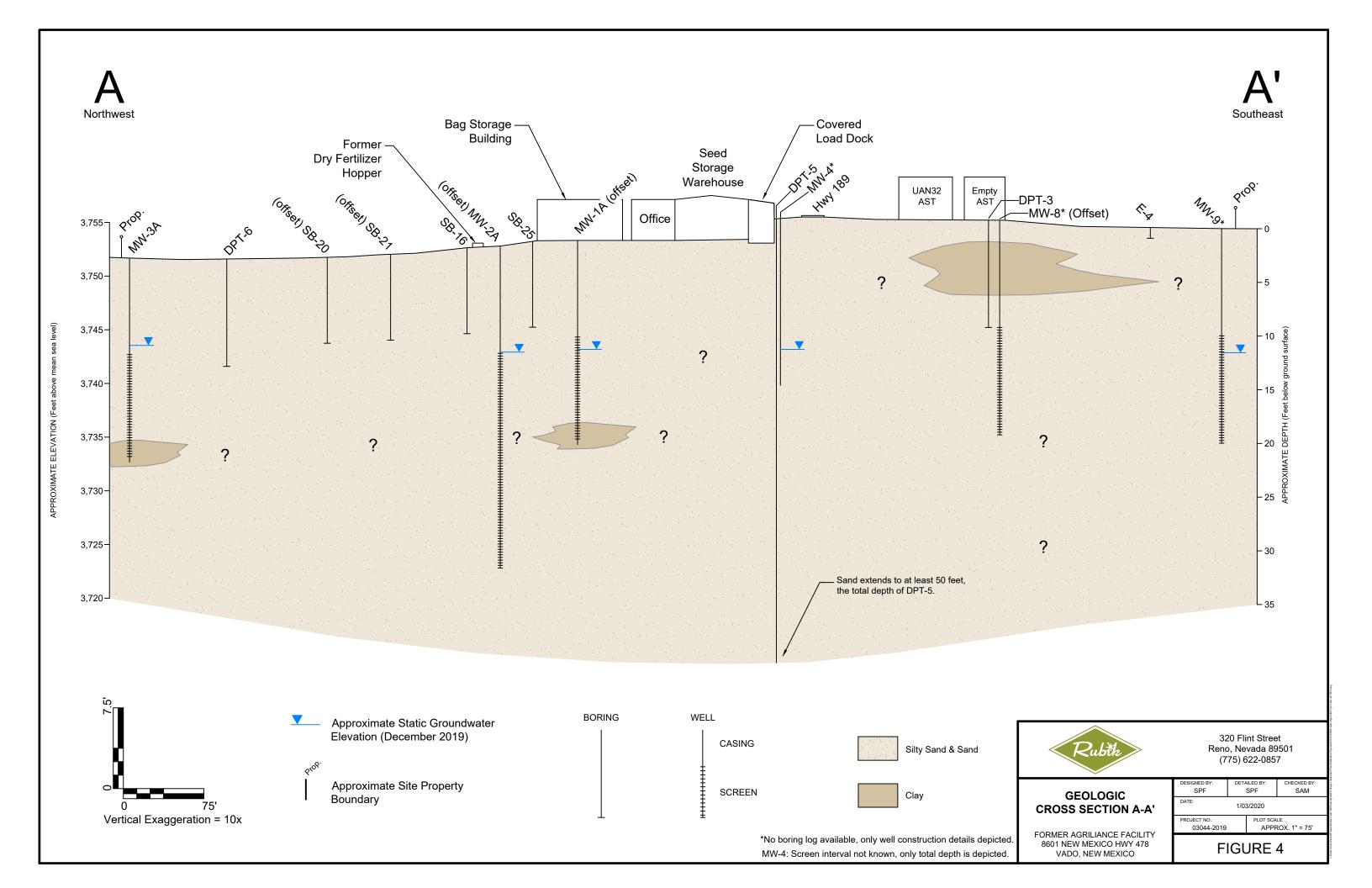
FORMER AGRILIANCE FACILITY **8601 NEW MEXICO HWY 478 VADO, NEW MEXICO**

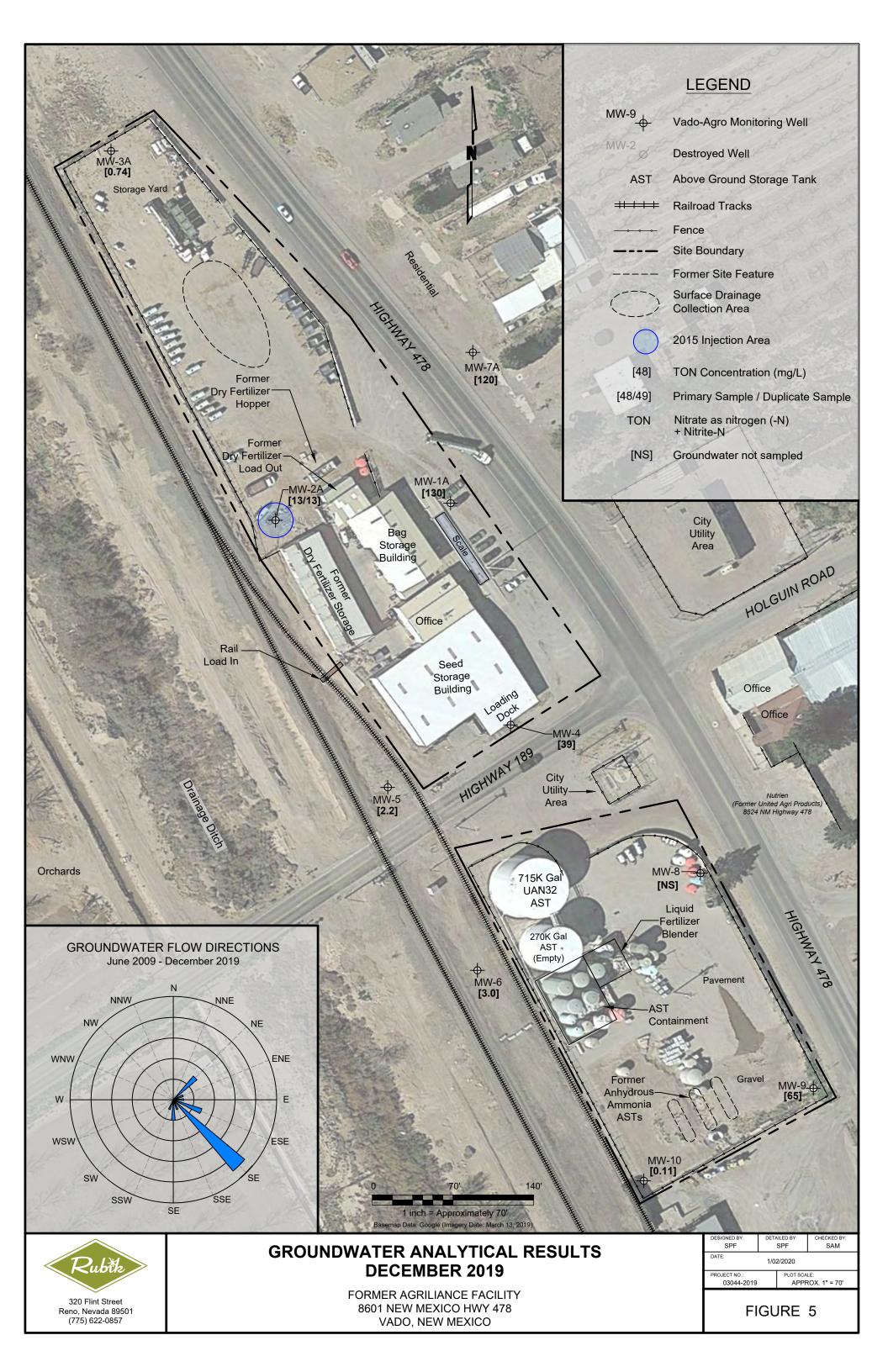
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PROJECT NO.:		PLOT SCALE:	
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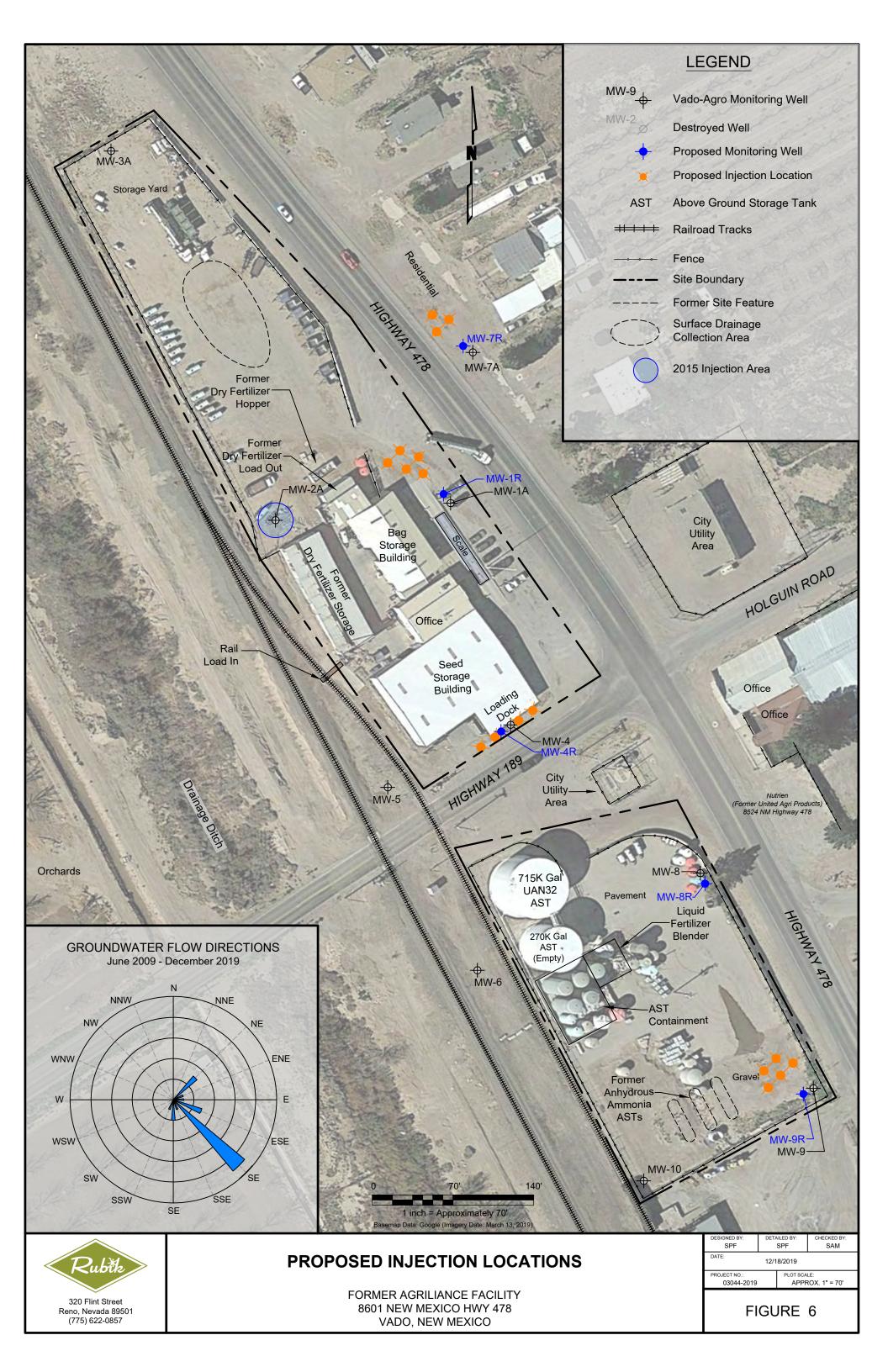
FIGURE 1











TABLES

STAGE 2 ABATEMENT PLAN MODIFICATION

Nutrien Ag Solution, Inc. Vado-Agro, New Mexico

February 2020



TABLE 1 MONITORING WELL CONSTRUCTION DETAILS

Former Agriliance Facility 8601 Highway 478 Vado, New Mexico

Well ID	Installation	Well Diameter	Top of Well Casing Elevation	Well Depth	Screen Interval (feet bgs)		
	Date	(inches)	(feet amsl)	(feet bgs)	Тор	Bottom	
MW-1 ¹	Sep. 2000	2	3822.59	21.5			
MW-1A	12/8/2010	2	3753.10	19	9	18.67	
MW-2 ¹	Sep. 2000	2	3753.05	15.5			
MW-2A	3/11/2015	2	Not Surveyed	30	10	30	
MW-3 ¹	Sep. 2000	2	3822.59	21.5			
MW-3A	12/7/2010	2	3751.67	19	9	18.67	
MW-4 ¹	Sep. 2000	2	3755.19	15.5			
MW-5	10/9/2001	2	3755.72	20	5	20	
MW-6	10/9/2001	2	3754.92	20	5	20	
MW-7 ¹	10/2/2002	2	3824.06	20	5	20	
MW-7A ¹	2/9/2005	2	3755.16	19			
MW-8 ²	8/19/2005	4	Damaged	20.7	10	20	
MW-9	8/19/2005	4	3757.18	20.7	10	20	
MW-10 ²	8/19/2005	4	3757.64	20.7	10	20	

Notes:

amsl = Above mean sea level

bgs = Below ground surface

Gray = Destroyed

-- = Unknown

¹ = Total well depth from field measurements or historical reports

² = Well information not clearly defined in log. Well depth and screen interval is assumed as similar to well MW-9, which was installed at the same time.

Well ID (Top of Casing Elevation ¹)	Date	Depth to Water (feet btoc)	Depth to Water (feet bgs)	Groundwater Elevation (feet amsl)	TON (mg/L)	Nitrate-N (mg/L)
				Groundwa	ater Standard =	10
MW-1	9/1/2000					130
3822.59	11/1/2000					98
	10/11/2001					200
	12/19/2001	7.15	Not Surveyed	3815.44		
	10/3/2002	7.38	7.60	3815.21		69
	11/21/2003			Dry		
	6/3/2004	10.12	10.34	3812.47		95
	2/8/2005	8.94	9.16	3813.65		98
	02/08/05 (dup)					98
	8/18/2005	7.42	7.64	3815.17		81
	12/1/2005	8.29	8.51	3814.30		187
	6/8/2006	8.28	Damaged	3814.31		130
	12/7/2006	8.56	8.78	3814.03		
	12/21/2006					173
	1/24/2007					198
	6/13/2007	8.21	8.43	3814.38		200
	12/13/2007	8.56	8.78	3814.03		230
	6/25/2008	7.93	8.15	3814.66		220
	12/4/2008	8.25	8.47	3814.34		130
	6/16/2009	7.74	7.96	3814.85		81
			DESTR	OYED		
MW-1A	12/9/2010	8.20	8.42	3744.90		170
3753.1	12/09/10 (dup)					180
	9/6/2011	8.65	8.87	3744.45		110
	12/8/2011	10.25	10.47	3742.85		62
	6/12/2012	11.08	11.30	3742.02		37
	12/5/2012	9.71	9.93	3743.39	53	
	12/5/2012 (dup)				51.3	
	6/27/2013	11.55	11.77	3741.55	83	
	6/27/2013 (dup)				88	
	12/10/2013	13.05	13.27	3740.05	95	
	5/27/2014	15.12	15.34	3737.98	92	
	12/4/2014	12.46	12.68	3740.64	95	
	12/4/2014 (dup)				32	
	6/30/2015		Well Inaccessib	le - Truck Parke	d over the Well	
	12/17/2015	11.63	11.85	3741.47	94	
	6/22/2016	11.05	11.27	3742.05	81	
	12/8/2016	10.60	10.82	3742.50	97	
	6/21/2017	9.91	10.13	3743.19	94	

Well ID (Top of Casing Elevation ¹)	Date	Depth to Water (feet btoc)	Depth to Water (feet bgs)	Groundwater Elevation (feet amsl)	TON (mg/L)	Nitrate-N (mg/L)
					iter Standard =	10
MW-1A	12/7/2017	8.45	8.67	3744.65	310	
(cont.)	6/12/2018	9.81	10.03	3743.29	100	
	12/13/2018	10.22	10.44	3742.88	150	
	6/27/2019	11.60	11.82	3741.50	180	
	12/10/2019	9.92	10.14	3743.18	130	
MW-2	9/1/2000		-			8.0
3753.05	11/1/2000		1			4.6
	10/11/2001	6.45	6.20	3746.60		4.9
	10/3/2002	6.61	6.36	3746.44		1.7
	11/21/2003	12.42	12.17	3740.63		ND
	6/3/2004	7.81	7.56	3745.24		
	7/7/2004					13
	07/07/04 (dup)					13
	2/8/2005	8.33	8.08	3744.72		42
	8/19/2005	6.58	6.33	3746.47		36
	12/1/2005	7.6	7.4	3745.45		27.3
	6/8/2006	7.5	7.3	3745.55		3.2
	12/21/2006	7.9	7.7	3745.15		275
	1/24/2007					106
	6/13/2007	7.54	7.29	3745.51		33
	12/13/2007	7.93	7.68	3745.12		33
	6/25/2008	7.26	7.01	3745.79		3.5
	12/4/2008	7.58	7.33	3745.47		200
	6/16/2009	7.09	6.84	3745.96		12
	12/15/2009	7.91	7.66	3745.14		130
	12/15/09 (dup)					130
	6/15/2010	7.10	6.85	3745.95		69
	12/9/2010	8.10	7.85	3744.95		56
	6/9/2011	8.35	8.10	3744.70		9.8
	12/8/2011	10.14	9.89	3742.91		29
	6/12/2012	10.88	10.63	3742.17		40
	12/6/2012	10.61	10.36	3742.44	103	
	6/27/2013	11.32	11.07	3741.73	100	
	12/10/2013	13.02	12.77	3740.03	84	
	5/27/2014	15.08	14.83	3737.97	110	
	12/5/2014	14.47	14.22	3738.58	140	
MW-2A*	3/17/2015	16.41	13.16		59	
1V1 V V ~ Z / \	4/29/2015	17.65	14.40		83	
	4/29/2015 (dup)				89	

Well ID (Top of Casing Elevation ¹)	Date	Depth to Water (feet btoc)	Depth to Water (feet bgs)	Groundwater Elevation (feet amsl)	TON (mg/L)	Nitrate-N (mg/L)
				Groundwa	ater Standard =	10
MW-2A*	5/28/2015	18.27	15.02		99	
(cont.)	5/28/2015 (dup)				89	
	6/30/2015	14.95	11.70		27	
	6/30/2015 (dup)				32	
	9/24/2015	13.50	10.25		49	
	9/24/2015 (dup)				46	
	12/17/2015	14.95	11.70		100	
	3/23/2016	15.22	11.97		89	
	6/22/2016	14.17	10.92		10	
	6/22/2016 (dup)				9.5	
	12/8/2016	13.94	10.69		27	
	12/8/2016 (dup)				57	
	6/21/2017	13.07	9.82		46	
	6/21/2017 (dup)				52	
	12/7/2017	11.04	7.79		93	
	12/7/2017 (dup)				95	
	6/12/2018	12.95	9.70		2.3	
	6/12/2018 (Dup)				2.6	
	12/13/2018	13.49	10.24		16	
	12/13/2010				16	
	6/26/2019	14.93	11.68		5.8	
	6/26/2019 (Dup)				6.0	
	12/10/2019	13.12	9.87		13	
	12/10/2019				13	
MW-3	9/1/2000					4.0
3820.41	11/1/2000					1.1
	10/11/2001					1.00
	12/19/2001	4.45	4.47	3815.96		
	10/3/2002	4.74	4.76	3815.67		1.1
	11/21/2003	8.81	8.83	3811.60		ND
	6/3/2004	7.98	8.00	3812.43		0.35
	2/8/2005	6.69	6.71	3813.72		13
	8/19/2005	5.09	5.11	3815.32		23
	12/1/2005	5.93	5.95	3814.48		12.2
	6/8/2006	5.84	5.86	3814.57		ND
	12/7/2006	6.19	6.21	3814.22		
	12/21/2006					30.1
	6/13/2007	5.81	5.83	3814.60		13
	06/13/07 (dup)					13

Well ID (Top of Casing Elevation ¹)	Date	Depth to Water (feet btoc)	Depth to Water (feet bgs)	Groundwater Elevation (feet amsl)	TON (mg/L)	Nitrate-N (mg/L)
				Groundwa	ater Standard =	10
MW-3	12/13/2007	6.26	6.28	3814.15		ND
(cont.)	6/25/2008	5.64	5.66	3814.77		0.23
	12/4/2008	5.92	5.94	3814.49		2.6
	6/16/2009	5.42	5.44	3814.99		0.93
			DESTR	OYED		
MW-3A	12/9/2010	6.31	6.33	3745.36		0.69
3751.67	6/9/2011	7.74	7.76	3743.93	-	1.7
	12/8/2011	8.43	8.45	3743.24		ND
	6/12/2012	9.33	9.35	3742.34		0.12
	12/6/2012	8.93	8.95	3742.74	12.7	
	6/27/2013	10.00	10.02	3741.67	6.1	
	12/10/2013	11.36	11.38	3740.31	11	
	12/10/2013 (dup)				11	
	5/27/2014	13.38	13.40	3738.29	5.8	
	12/4/2014	10.75	10.77	3740.92	30	
	6/30/2015	10.32	10.34	3741.35	5.2	
	12/17/2015	9.92	9.94	3741.75	7.0	
	12/17/2015 (dup)				7.8	
	6/22/2016	9.51	9.53	3742.16	<0.020	
	12/8/2016	8.92	8.94	3742.75	29	
	6/21/2017	8.23	8.25	3743.44	1.1	
	12/7/2017	6.47	6.49	3745.20	0.76	
	6/12/2018	7.93	7.95	3743.74	1.0	
	12/13/2018	8.44	8.46	3743.23	14	
	6/26/2019	9.75	9.77	3741.92	7.0	
	12/10/2019	8.12	8.14	3743.55	0.74	
MW-4	9/1/2000					100
3755.19	11/1/2000					33
	10/12/2001					41
	12/19/2001	8.8	8.9	3746.39		
	10/3/2002	9.12	9.25	3746.07		78
	11/21/2003		•	Dry		
	6/3/2004	11.79	11.92	3743.40		39
	2/8/2005	10.69	10.82	3744.50		65
	8/19/2005	9.17	9.30	3746.02		32
	12/1/2005	10	10	3745.19		64.2
	6/8/2006	11.93	12.06	3743.26		25
	6/8/06 (dup)					23
	12/21/2006	10.29	10.42	3744.90		29.5

Well ID (Top of Casing Elevation ¹)	Date	Depth to Water (feet btoc)	Depth to Water (feet bgs)	Groundwater Elevation (feet amsl)	TON (mg/L)	Nitrate-N (mg/L)		
				Groundwa	ater Standard =	10		
MW-4	6/13/2007	10	10	3745.19		20		
(cont.)	12/13/2007	10.33	10.46	3744.86		50		
	6/25/2008	9.64	9.77	3745.55		92		
	12/4/2008	10.01	10.14	3745.18		54		
	6/16/2009	9.45	9.58	3745.74		50		
	12/15/2009	10.33	10.46	3744.86		40		
	6/15/2010	9.47	9.60	3745.72		40		
	12/9/2010	10.35	10.48	3744.84		26		
	6/9/2011	10.69	10.82	3744.50		56		
	12/8/2011	12.42	12.55	3742.77		170		
	6/12/2012	13.05	13.18	3742.14		260		
	12/5/2012	12.82	12.95	3742.37	34.6			
	6/27/2013	13.44	13.57	3741.75	38			
	12/10/2013	15.19	15.32	3740.00	28			
	5/27/2014	Insufficient Water in the Well						
	12/5/2014	14.61	14.74	3740.58	16			
	6/30/2015	13.62	13.75	3741.57	14			
	12/17/2015	13.70	13.83	3741.49	19			
	6/22/2016	12.99	13.12	3742.20	46			
	12/8/2016	12.75	12.88	3742.44	49			
	6/21/2017	11.90	12.03	3743.29	43			
	12/7/2017	10.56	10.69	3744.63	38			
	6/12/2018	11.81	11.94	3743.38	110			
	12/13/2018	12.33	12.46	3742.86	54			
	6/27/2019	13.79	13.92	3741.40	63			
	12/11/2019	12.02	12.15	3743.17	39			
MW-5	10/12/2001					0.74		
3755.72	12/19/2001	8.7	8.8	3747.02				
	10/3/2002	9.59	9.73	3746.13		ND		
	11/21/2003	18.16	18.30	3737.56		ND		
	6/3/2004	12.37	12.51	3743.35		0.99		
	2/8/2005	11.28	11.42	3744.44		3.0		
	8/19/2005	9.5	9.6	3746.22		12		
	08/19/05 (dup)					14		
	12/1/2005	10.53	10.67	3745.19		3.10		
	6/8/2006	10.46	10.60	3745.26		0.30		
	12/21/2006	10.81	10.95	3744.91		41.7		
	6/13/2007	10.55	10.69	3745.17		5.50		
	12/13/2007	10.89	11.03	3744.83		2.20		

Well ID (Top of Casing Elevation ¹)	Date	Depth to Water (feet btoc)	Depth to Water (feet bgs)	Groundwater Elevation (feet amsl)	TON (mg/L)	Nitrate-N (mg/L)	
				Groundwa	ater Standard =	10	
MW-5	6/25/2008	10.11	10.25	3745.61		0.93	
(cont.)	12/4/2008	10.6	10.7	3745.12		61	
	6/16/2009	9.97	10.11	3745.75		0.21	
	12/15/2009	10.91	11.05	3744.81		6.50	
	6/15/2010	9.98	10.12	3745.74		0.31	
	06/15/10 (dup)					0.63	
	12/9/2010	10.94	11.08	3744.78		0.63	
	6/9/2011	11.58	11.72	3744.14		1.90	
	12/8/2011	12.96	13.10	3742.76		2.20	
	6/12/2012	13.53	13.67	3742.19		5.1	
	12/5/2012	13.46	13.60	3742.26	9.3		
	6/27/2013	13.89	14.03	3741.83	12		
	12/10/2013	15.82	15.96	3739.90	22		
	5/27/2014	17.88	18.02	3737.84	43		
	12/4/2014	15.20	15.34	3740.52	8.2		
	6/30/2014	14.02	14.16	3741.70	18		
	12/17/2015	14.33	14.47	3741.39	4.7		
	6/22/2016	13.34	13.48	3742.38	6.3		
	12/8/2016	13.34	13.48	3742.38	27		
	6/21/2017	12.33	12.47	3743.39	6.7		
	12/7/2017	WELL NOT SAMPLED - DAMAGED					
	6/12/2018	12.28	12.42	3743.44	0.29		
	12/13/2018	12.93	13.07	3742.79	0.66		
	6/27/2019	14.37	14.51	3741.35	4.7		
	12/11/2019	12.61	12.75	3743.11	2.2		
MW-6	10/12/2001					0.47	
3754.92	12/19/2001	9.3	9.3	3745.62			
	10/3/2002	8.9	8.9	3746.02		ND	
	11/21/2003	17.33	17.29	3737.59		ND	
	11/21/03 (dup)					ND	
	6/3/2004	11.65	11.61	3743.27		1.7	
	2/8/2005	10.59	10.55	3744.33		1.0	
	8/18/2005	8.75	8.71	3746.17		0.71	
	12/1/2005	9.82	9.78	3745.10		1.71	
	6/8/2006	9.66	9.62	3745.26		0.19	
	12/21/2006	10.14	10.10	3744.78		6.77	
	6/13/2007	9.83	9.79	3745.09		0.21	
	12/13/2007	10.25	10.21	3744.67		0.43	
	12/13/07 (dup)					0.46	

Well ID (Top of Casing Elevation ¹)	Date	Depth to Water (feet btoc)	Depth to Water (feet bgs)	Groundwater Elevation (feet amsl)	TON (mg/L)	Nitrate-N (mg/L)	
			10				
MW-6	6/25/2008	9.48	9.44	3745.44		1.5	
(cont.)	12/4/2008	9.92	9.88	3745.00		2.5	
,	6/16/2009	9.26	9.22	3745.66		5.3	
	12/15/2009	10.24	10.20	3744.68		1.0	
	6/15/2010	9.31	9.27	3745.61		14	
	12/9/2010	10.30	10.26	3744.62		6.3	
	6/9/2011	10.45	10.41	3744.47		0.3	
	12/8/2011	12.22	12.18	3742.70		0.8	
	6/12/2012	12.76	12.72	3742.16		1.6	
	12/5/2012	12.75	12.71	3742.17	2.74		
	6/27/2013	13.06	13.02	3741.86	21		
	12/10/2013	15.11	15.07	3739.81	1.2		
	5/27/2014	17.16	17.12	3737.76	3.5		
	12/4/2014	14.50	14.46	3740.42	36		
	6/30/2015	13.05	13.01	3741.87	12		
	12/17/2015	13.59	13.55	3741.33	5.4		
	6/22/2016	12.52	12.48	3742.40	1.6		
	12/8/2016	12.64	12.60	3742.28	2.1		
	6/21/2017	11.57	11.53	3743.35	1.5		
	12/7/2017	10.45	10.41	3744.47	5.5		
	6/12/2018	11.55	11.51	3743.37	11		
	12/13/2018	12.25	12.21	3742.67	6.5		
	6/26/2019	14.23	14.19	3740.69	8.6		
	12/11/2019	11.90	11.86	3743.02	3.0		
MW-7	10/3/2002	6.28	6.34	3817.78		53	
3824.06	10/03/02 (dup)					54	
	11/21/2003	INACCESSIBLE					
	6/3/2004	DESTROYED					
MW-7A	2/9/2005	10.51	10.57	3744.65		100	
3755.16	8/19/2005	9.09	9.15	3746.07		73	
	12/1/2005	9.93	9.99	3745.23		76.9	
	6/8/2006	9.92	9.98	3745.24		91	
	12/21/2006	10.11	10.17	3745.05		181	
	1/24/2007					183	
	6/13/2007	9.77	9.83	3745.39		160	
	12/13/2007	10.08	10.14	3745.08		150	
	6/25/2008	9.46	9.52	3745.70		130	
	06/25/08 (dup)					130	
	12/4/2008	9.81	9.87	3745.35		120	

Well ID (Top of Casing Elevation ¹)	Date	Depth to Water (feet btoc)	Depth to Water (feet bgs)	Groundwater Elevation (feet amsl)	TON (mg/L)	Nitrate-N (mg/L)
				Groundwa	ater Standard =	10
MW-7A	6/16/2009	9.33	9.39	3745.83		110
(cont.)	12/15/2009	10.08	10.14	3745.08		73
	6/15/2010	9.31	9.37	3745.85		87
	12/9/2010	10.10	10.16	3745.06		64
	6/9/2011	10.65	10.71	3744.51		67
	12/8/2011	12.26	12.32	3742.90		71
	6/12/2012	13.03	13.09	3742.13		93
	12/5/2012	12.56	12.62	3742.60	70.5	
	6/27/2013	13.64	13.70	3741.52	38	
	12/10/2013	14.98	15.04	3740.18	33	
	5/27/2014	17.00	17.06	3738.16	34	
	5/27/2014 (dup)				37	
	12/5/2014	16.61	16.67	3738.55	57	
	6/30/2015	13.95	14.01	3741.21	27	
	12/17/2015	13.58	13.64	3741.58	54	
	6/22/2016	13.20	13.26	3741.96	49	
	12/8/2016	12.58	12.64	3742.58	71	
	6/21/2017	11.95	12.01	3743.21	59	
	12/7/2017	10.37	10.43	3744.79	54	
	6/12/2018	11.80	11.86	3743.36	72	
	12/13/2018	12.15	12.21	3743.01	62	
	6/27/2019	13.52	13.58	3741.64	80	
	12/11/2019	11.87	11.93	3743.29	120	
MW-8	8/19/2005					2
3824.24	12/1/2005					3.4
	6/8/2006					12
	12/21/2006					11.8
	6/13/2007					15
	12/13/2007					10
	6/25/2008					16
	12/4/2008					14
	6/16/2009	9.72	9.72	3814.52		11
	12/15/2009	10.57	10.57	3813.67		14
	6/15/2010	9.71	9.71	3814.53		11
	12/9/2010	10.57	10.57	3813.67		18
	6/9/2011	10.9	10.9	3813.34		38
	6/9/2011 (dup)					38
	12/8/2011	12.4	12.4	3811.84		34
	6/12/2012	13.18	13.18	3811.06		42

TABLE 2 HISTORICAL GROUNDWATER ELEVATION AND ANALYTICAL DATA

Former Agriliance Facility 8601 Highway 478 Vado, New Mexico

Well ID (Top of Casing Elevation ¹)	Date	Depth to Water (feet btoc)	Depth to Water (feet bgs)	Groundwater Elevation (feet amsl)	TON (mg/L)	Nitrate-N (mg/L)
	ater Standard =	10				
MW-9	8/19/2005					0.34
3757.18	12/1/2005					5.03
	6/8/2006					9.4
	12/21/2006					21
	6/13/2007					9.2
	12/13/2007					16
	6/25/2008					24
	12/4/2008					58
	6/16/2009	11.83	9.08	3745.35		70
	12/15/2009	12.72	9.97	3744.46		48
	6/15/2010	11.80	9.05	3745.38		61
	12/9/2010	12.74	9.99	3744.44		31
	6/9/2011	13.00	10.25	3744.18		52
	12/8/2011	15.90	13.15	3741.28		41
	12/8/2011 (dup)					41
	6/12/2012	15.11	12.36	3742.07		38
	12/6/2012	15.12	12.37	3742.06	48	
	6/27/2013	15.52	12.77	3741.66	31	
	12/10/2013	17.37	14.62	3739.81	29	
	5/27/2014	19.33	16.58	3737.85	35	
	12/4/2014	16.74	13.99	3740.44	66	
	6/30/2015	15.20	12.45	3741.98	19	
	12/17/2015	15.90	13.15	3741.28	34	
	6/22/2016	15.04	12.29	3742.14	48	
	12/8/2016	14.93	12.18	3742.25	35	
	6/21/2017	14.12	11.37	3743.06	51	
	12/7/2017	12.45	9.70	3744.73	48	
	6/12/2018	14.01	11.26	3743.17	49	
	12/13/2018	14.58	11.83	3742.60	38	
	6/26/2019	16.03	13.28	3741.15	48	
	12/10/2019	14.32	11.57	3742.86	65	
MW-10	8/19/2005					1.4
3757.64	12/1/2005					ND
	6/8/2006					ND
	12/21/2006		-			ND
	12/21/06 (dup)					ND
	6/13/2007		-			3.4
	12/13/2007					0.27
	6/25/2008					0.13

TABLE 2 HISTORICAL GROUNDWATER ELEVATION AND ANALYTICAL DATA

Former Agriliance Facility 8601 Highway 478 Vado, New Mexico

Well ID (Top of Casing Elevation ¹)	Date	Depth to Water (feet btoc)	Depth to Water (feet bgs)	Groundwater Elevation (feet amsl)	TON (mg/L)	Nitrate-N (mg/L)
				Groundwa	ater Standard =	10
MW-10	12/4/2008					ND
(cont.)	6/16/2009	12.17	10.12	3745.47		0.15
	06/16/09 (dup)		-			0.13
	12/15/2009	13.10	11.05	3744.54		0.39
	6/15/2010	12.14	10.09	3745.50		0.70
	12/9/2010	13.18	11.13	3744.46		0.59
	6/9/2011	13.30	11.25	3744.34		ND
	12/8/2011	15.96	13.91	3741.68		0.28
	6/12/2012	15.44	13.39	3742.20		<0.10
	12/6/2012	15.61	13.56	3742.03	<1.0	
	6/27/2013	15.81	13.76	3741.83	0.55	
	12/10/2013	17.88	15.83	3739.76	23	
	5/27/2014	19.94	17.89	3737.70	20	
	12/4/2014	17.27	15.22	3740.37	24	
	6/30/2015	15.92	13.87	3741.72	4.0	
	12/17/2015	16.40	14.35	3741.24	1.3	
	6/22/2016	15.26	13.21	3742.38	1.7	
	12/8/2016	15.46	13.41	3742.18	1.7	
	6/21/2017	14.41	12.36	3743.23	0.060	
	12/7/2017	13.40	11.35	3744.24	2.5	
	6/12/2018	14.36	12.31	3743.28	0.77	
	12/13/2018	15.08	13.03	3742.56	0.16 J	
	6/26/2019	16.55	14.50	3741.09	3.6	
	12/10/2019	14.75	12.70	3742.89	0.11	

Notes

btoc = below top of casing

bgs = below ground surface

amsl = above mean sea level

mg/L = Milligrams per liter

TON = Total Oxidized Nitrogen (Nitrate + Nitrite as Nitrogen) by EPA 353.2

Nitrate-N = Nitrate as nitrogen by EPA 300.0

<1.0 = Analyte not detected above specified laboratory reporting limit.

ND = Not detected

-- = Not analyzed or not measured

¹ = TOC elevations were resurveyed on May 26, 2013 by Z3 Planners & Surveyors. Historical groundwater elevations were recalculated with the new TOC elevations.

* = Well not surveyed

J = Estimated Concentration

TABLE 3 LACTOIL INJECTION MONITORING SUMMARY

Former Agriliance Facility 8601 Highway 478 Vado, New Mexico

Well ID	Sample Date	Depth to Groundwater (feet btoc)	TON (mg/L)	TOC (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Temp (Celsius)	pH (SU)	Conductivit y (uS)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)
	3/17/2015*	16.41	59	2.6	110	330	18.6	7.71	1,794	0.33	238	180
	4/29/2015	17.65	83 / 89	4.9 / 5.2	83 / 89	320 / 320	19.2	7.63	1,912	NA	230	183.60
	5/28/2015	18.27	99 / 89	3.0 / 3.1	86 / 96	330 / 360	19.9	8.09	1,978	NA	NA	95.45
	6/30/2015	14.95	27 / 32	31	68	150	23.1	7.75	1,643	2.0	-102.1	27.69
	9/24/2015	13.50	49 / 46	7.3 / 7.4	64 / 64	270 / 270	21.4	7.24	1,852	1.75	165.4	17.57
	12/17/2015	14.95	100	2.5	57	300	18.4	7.39	1,592	17.9	173.9	82.50
	3/23/2016	16.29	89	5.7	85	310	20.6	7.03	1,891	26.5	288.9	
MW-2A	6/22/2016	14.17	10 / 9.5	7.2 / 6.1	110 / 120	310 / 320	19.1	7.53	1,425	2.46	74.2	
	12/8/2016	13.94	27 / 57	2.3 / 2.3	120 / 120	390 / 390	12.8	8.00	1,617	6.98	229.3	113.4
	6/21/2017	13.07	46 / 52	2.6 / 2.5	120 / 120	330 / 370	21.7	7.93	1,750	91.04	-22.1	33.16
	12/7/2017	11.04	93 / 95	2.6 / 2.3	190 / 190	430 / 430	20.4	7.40	2,366	4.41	100.1	104.1
	6/12/2018	12.95	2.3 / 2.6				24.5	8.49	1,670	3.59	286.9	15.3
	12/13/2018	13.49	16 / 16				19.9	7.60	1,388	3.78	210.0	253.12
	6/26/2019	14.93	5.8 / 6.0				21.8	7.57	1,209	2.03	222.5	55.27
	12/10/2019	13.12	13 / 13				21.4	7.53	1,167	4.18	185.9	37.53

Notes

btoc = below top of casing

TON = Total Oxidized Nitrogen (Nitrate + Nitrite as Nitrogen) by EPA 353.2

* = Baseline sample

TOC = Total Organic Carbon by EPA 9060A

mg/L = Milligrams per liter

Inorganic lons = Chloride and sulfate by EPA A4500

27 / 32 = Sample / duplicate results

uS = Microsiemens

mV = Millivolt

NTU = Nephelometric Turbidity Unit

TABLE 4 HISTORICAL SOIL SAMPLING ANALYTICAL RESULTS

Former Agriliance Vado Facility 8601 Highway 478 Vado, New Mexico

Location ID	Sample Date	Sample Depth (feet bgs)	Nitrate-N (mg/kg)	Ammonia-N (mg/kg)	
	NMED So	oil Screening Level =	425		
DPT1	10/9/2001	2.5 - 3.0	240	24	
DITI	10/3/2001	6.5 - 8.0	74	<10	
DPT2	10/10/2001	2.5 - 3.0	69	<10	
51 12	10/10/2001	6.5 - 8.0	44	<10	
DPT3	10/9/2001	2.5 - 3.0	65	<10	
2	. 0, 0, 200 .	6.5 - 8.0	15	<10	
DPT4	10/10/2001	2.5 - 3.0	150	<10	
		6.5 - 8.0	31	<10	
DPT5	10/10/2001	2.5 - 3.0	100	<10	
		6.5 - 8.0	20	<10	
DPT6	10/10/2001	2.5 - 3.0	17	<10	
		6.5 - 8.0	16	<10	
SB-7	3/3/2009	2 - 2.5	155	16.8	
		5.5 - 6	145	8.96	
SB-8	3/3/2009	2 - 2.5	9.36	16.2	
	3/3/2009	5.5 - 6 2 - 2.5	15.2 74.1	15.7 32.5	
SB-9		2 - 2.5 5.5 - 6	74.1 40	32.5 23.5	
	3/3/2009	2 - 2.5	115	169	
SB-10		2 - 2.5 5.5 - 6	114	52.6	
		2 - 2.5	1270	2030	
SB-11	3/3/2009	5.5 - 6	1280	23.5	
		2 - 2.5	672	3780	
SB-12	3/3/2009	5.5 - 6	527	1770	
27.12	- /- /	2 - 2.5	167	19	
SB-13	3/3/2009	5 - 5.5	141	16.8	
OD 44	0/0/0000	2 - 2.5	230	23.5	
SB-14	3/3/2009	5.5 - 6	172	10.1	
SB-15	2/2/2000	2 - 2.5	1490	1100	
3D-13	3/3/2009	6 - 6.5	168	94.1	
SB-16	3/3/2009	2 - 2.5	696	54.3	
3D-10	3/3/2009	5.5 - 6	64	6.72	
SB-19	3/3/2009	2 - 2.5	161	11.8	
SB-10	3/3/2009	5.5 - 6	34.8	8.96	
SB-20	3/3/2009	2 - 2.5	66.1	22.4	
		5 - 5.5	5.32	13.4	
SB-21	3/3/2009	2 - 2.5	5.46	11.2	
		5.5 - 6	9.98	11.8	
SB-22	3/3/2009	2 - 2.5	2.3	9.52	
		5.5 - 6	4.52	11.2	

TABLE 4 HISTORICAL SOIL SAMPLING ANALYTICAL RESULTS

Former Agriliance Vado Facility 8601 Highway 478 Vado, New Mexico

Location ID	Sample Date	Sample Depth (feet bgs)	Nitrate-N (mg/kg)	Ammonia-N (mg/kg)
	NMED Sc	l oil Screening Level =	425	
00.00			18.1	16.8
SB-23	3/3/2009	2 - 2.5 5.5 - 6	14.9	8.96
27.21	2/2/222	2 - 2.5	60	11.2
SB-24	3/3/2009	5 - 5.5	50.1	13.4
00.05	0/0/0000	2 - 2.5	177	14.6
SB-25	3/3/2009	5.5 - 6	165	ND
00.00	0/0/0000	2.5 - 3	92.6	10.1
SB-26	3/3/2009	6 - 6.5	29.2	10.6
00.07	0/0/0000	2 - 2.5	94	7.84
SB-27	3/3/2009	5.5 - 6	200	7.84
2009 SPILL RESPO	NSE SAMPLING			
SS-1	6/24/2009	0.5	391	235
SS-2	6/24/2009	0.5	391	300
SS-3	6/24/2009	0.5	443	289
SS-4	6/24/2009	0.5	321	267
SS-5	6/24/2009	0.5	2450	831
SS-6	6/24/2009	0.5	494	414
SS-7	6/24/2009	0.5	2380	2200
SS-8	6/24/2009	0.5	323	113
E-1	9/9/2009	0.5	160	852
E-2	9/9/2009	0.5	71.9	260
E-3	9/9/2009	0.5	273	116
E-4	9/9/2009	0.5	258	767
POST-EXCAVATIO	N SAMPLING - FOR	RMER FERTILIZER	LOAD-OUTS	
SB-11-1	12/6/2010	4	75	
SB-11-2	12/6/2010	4	120	
SB-11-3	12/6/2010	4	360	
OD-11 - 0	12/8/2010	8	1300	
SB-11-4	12/6/2010	4	500	
OD-11 - 4	12/8/2010	8	1300	
SB-11-5	12/6/2010	4	940	
OD-11 - 0	12/8/2010	8	1400	
SB-15-1	12/7/2010	4	19	
SB-15-2	12/7/2010	4	79	
SB-15-3	12/7/2010	4	1400	
OD-10-0	12/9/2010	8	93	
SB-15-4	12/7/2010	4	1200	
00-10-4	12/9/2010	8	48	
SB-15-5	12/7/2010	4	210	
SS-7-1	12/7/2010	3	13	

TABLE 4 HISTORICAL SOIL SAMPLING ANALYTICAL RESULTS

Former Agriliance Vado Facility 8601 Highway 478 Vado, New Mexico

Location ID	Sample Date	Sample Depth (feet bgs)	Nitrate-N (mg/kg)	Ammonia-N (mg/kg)
	NMED So	425		
	11/9/2013	1	1.3	
GP-1	11/9/2013	5	18	
	11/9/2013	9	160	
CONFIRMATION S	AMPLING - SPILL A	AREA NEAR SCALE		
HA-SS-1	3/11/2015	2	63	
HA-SS-2	3/11/2015	2	35	
HA-SS-3	3/11/2015	2	2.5	
HA-SS-5	3/11/2015	2	100	

Notes

bgs = below the ground surface

mg/kg = milligrams per kilogram

Nitrate-N = Nitrate as nitrogen by SM4500, EPA 300.0, or EPA 353.2

Ammonia-N = Ammonia as nitrogen by SM4500

NMED = New Mexico Environment Department

= Soil removed during 2015 excavation

APPENDIX A

GRAPHS OF COC CONCENTRATIONS AND DEPTH TO WATER OVER TIME

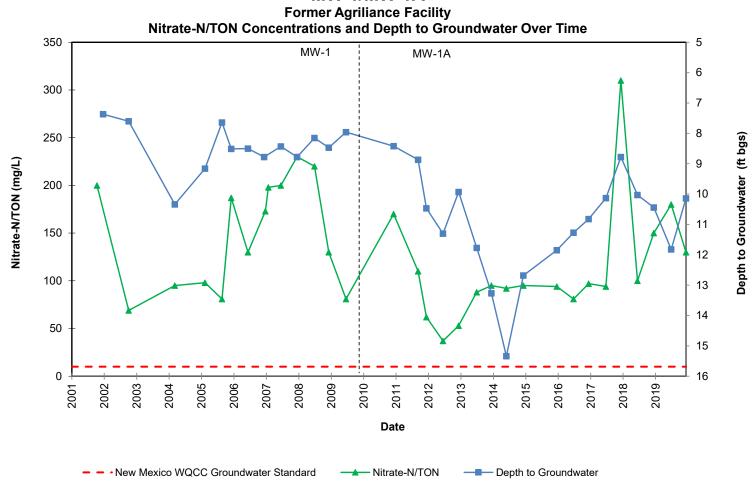
STAGE 2 ABATEMENT PLAN MODIFICATION

Nutrien Ag Solution, Inc. Vado-Agro, New Mexico

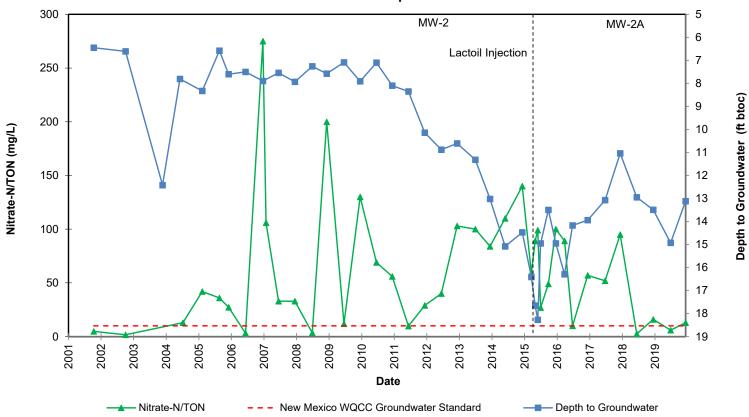
February 2020



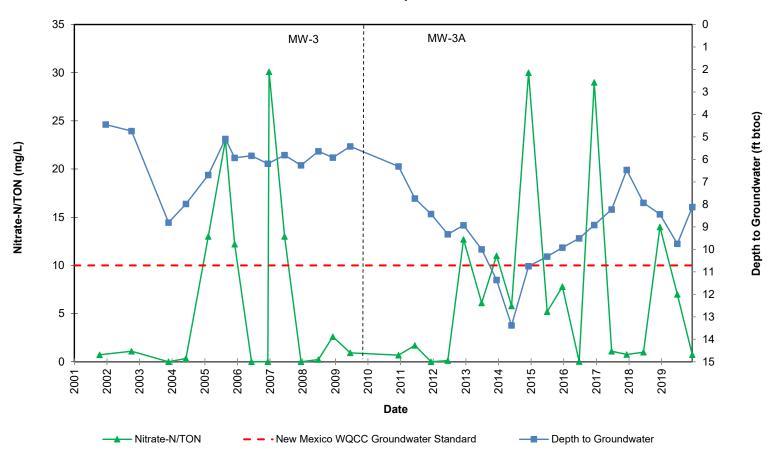
MW-1/MW-1A



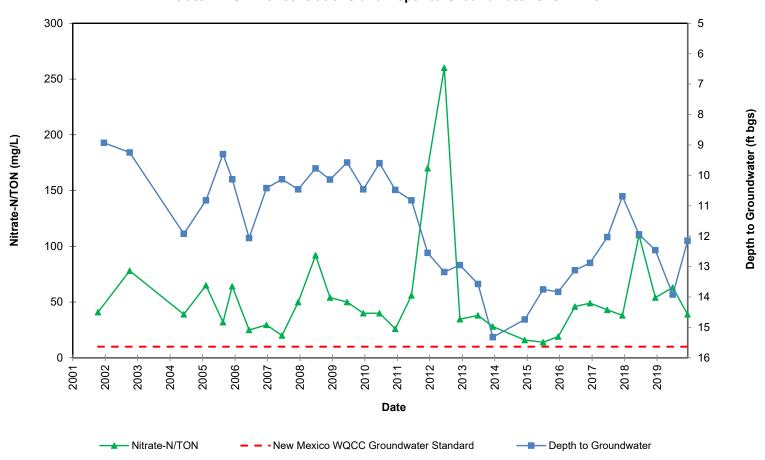
MW-2/MW-2A
Former Agriliance Facility
Nitrate-N/TON Concentrations and Depth to Groundwater Over Time



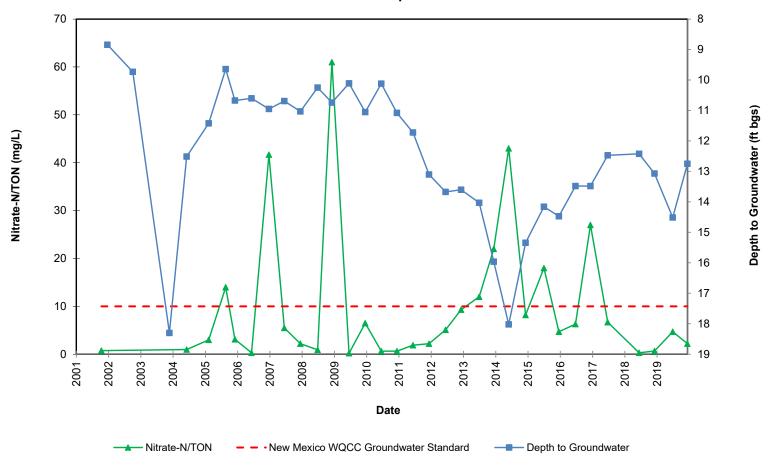
MW-3/MW-3A
Former Agriliance Facility
Nitrate-N/TON Concentrations and Depth to Groundwater Over Time



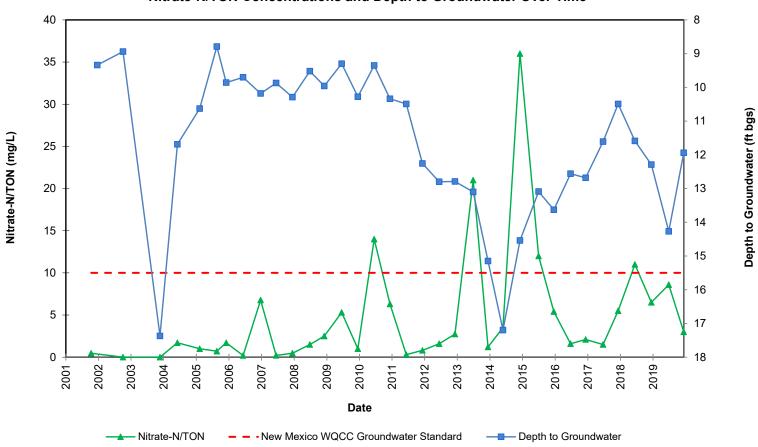
MW-4
Former Agriliance Facility
Nitrate-N/TON Concentrations and Depth to Groundwater Over Time



MW-5 (Damaged)
Former Agriliance Facility
Nitrate-N/TON Concentrations and Depth to Groundwater Over Time



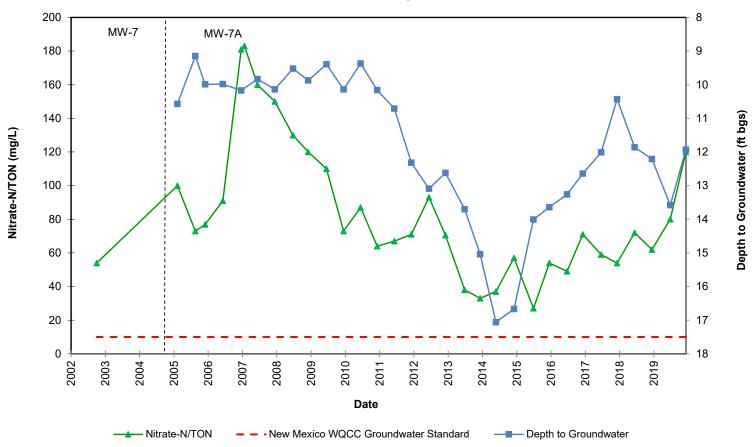
MW-6
Former Agriliance Facility
Nitrate-N/TON Concentrations and Depth to Groundwater Over Time



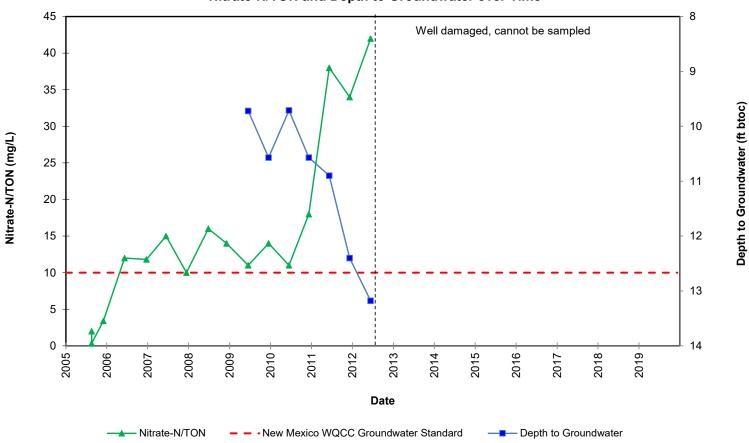
MW-7/MW-7A

Former Agriliance Facility

Nitrate-N/TON Concentrations and Depth to Groundwater Over Time



MW-8 (Damaged)
Former Agriliance Facility
Nitrate-N/TON and Depth to Groundwater over Time



Former Agriliance Facility
Nitrate-N/TON Concentrations and Depth to Groundwater Over Time Nitrate-N/TON (mg/L) 2019 -Date

- New Mexico WQCC Groundwater Standard

─ Depth to Groundwater

── Nitrate-N/TON

Depth to Groundwater (ft bgs)

MW-9

Depth to Groundwater (ft bgs) Nitrate-N/TON (mg/L) 2005 ∤ Date

New Mexico WQCC Groundwater Standard

Nitrate-N/TON

── Depth to Groundwater

MW-10
Former Agriliance Facility
Nitrate-N/TON and Depth to Groundwater Over Time

APPENDIX B

LACTOIL PRODUCT INFORMATION SHEET STAGE 2 ABATEMENT PLAN MODIFICATION

Nutrien Ag Solution, Inc. Vado-Agro, New Mexico

February 2020

LACTOIL® SOY MICROEMULSION

CONCENTRATED FORMULATION PROVIDES SAVINGS THROUGH INCREASED DISTRIBUTION, EXTENDED LONGEVITY, HIGH EFFICIENCY

LACTOIL® is a thermodynamically stable microemulsion designed to provide the subsurface distribution and remediation performance characteristics of a highly soluble substrate with the longevity of a vegetable oil.



INCREASED SUBSURFACE DISTRIBUTION:

- Average particle size < 1 micron
- High emulsion stability allows for greater subsurface transport

EXTENDED LONGEVITY:

- 98% fermentable emulsion
- Emulsion particles contain both readily soluble and slowly soluble material

INCREASED DEGRADATION RATES:

Provides sustained lactate for accelerated metabolism

HIGHER EFFICIENCY:

 Increased contaminant degradation per unit of fermentable product injected as compared to standard EVO

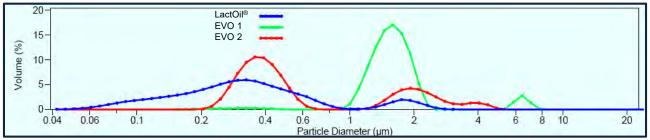
CONTAMINANTS TREATED:

 Chlorinated solvents, nitrates, perchlorate, RDX, metals, trichloropropane, mine impacted water

TREATMENT APPLICATIONS:

Permanent wells, direct push, excavation backfill, bedrock

Particle Size Analysis



Analysis conducted using 1:10 dilution on a Beckman Coulter Light Scattering Particle Size Analyzer





Michelle Lujan Grisham Governor

> **Howie C. Morales** Lieutenant Governor

NEW MEXICO ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

1190 St. Francis Drive / PO Box 5469 Santa Fe, NM 87502-5469 Phone (505) 827-2900 Fax (505) 827-2965 www.env.nm.gov



James C. Kenney
Cabinet Secretary

Jennifer J. Pruett
Deputy Secretary

July 13, 2020

Kevin Bertrand Nutrien Ag Solutions, Inc. 5296 Harvest Lake Drive Loveland, Colorado 80538

Sent via e-mail: Kevin.Bertrand@nutrien.com

RE: Stage 2 Abatement Plan Modification and Work Plan Approval, Nutrien Ag Solutions – Former Agriliance Facility, Vado, New Mexico

Mr. Bertrand,

The New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) is in receipt of a Stage 2 Abatement Plan (S2AP) modification and work plan proposal (Plan), dated February 3, 2020, for the Nutrien Ag Solutions (Nutrien) facility located at 8601 Highway 478 Vado, New Mexico (Site), formerly owned by Agriliance, Inc. Rubik Environmental Consulting submitted the Plan on your behalf in response to a discussion held with the NMED on October 10, 2019, regarding the need for continued remediation of Site groundwater contaminated with nitrogen compounds.

Key elements of the Plan include:

- The plugging, abandonment, and replacement of MW-1A, MW-4, MW-7A, and MW-9;
- Replacement of MW-8 due to irreparable damage;
- Replacement monitoring well development and surveying;
- Injections of Lactoil® to a maximum depth of 30 feet below ground surface (bgs) upgradient of each replacement monitoring well using a truck-mounted direct push rig;
- A single groundwater sampling event prior to Lactoil[®] injections;
- Post-injection groundwater sampling on a quarterly basis for two years;
- Reporting to NMED after injections are complete and on a quarterly basis thereafter.

The GWQB hereby approves the Plan pursuant to Section 4111 of the New Mexico Ground and Surface Water Protection regulations, 20.6.2 NMAC. Furthermore, NMED determines proposed Plan actions do not constitute a "significant modification of Stage 2 of the abatement plan," as defined in 20.6.2.7 NMAC; therefore, NMED will not require Nutrien to complete public notice obligations as listed under 20.6.2.4108 NMAC.

Since Plan actions include the injection of fluids to facilitate groundwater remediation, you are required to apply for a NMED General Discharge Permit per 20.6.2.5002.B(5)(d)(ii) NMAC. Please submit a UIC General Discharge Permit Application to the GWQB Pollution Prevention Section (PPS). The form is

Mr. Bertrand July 13, 2020 Page 2 of 2

available for download at: https://www.env.nm.gov/gwqb/forms/. In accordance with 20.6.2.4107.B NMAC, NMED also requires at least four working days advance notice prior to conducting any sampling, drilling, or plugging and abandonment activities at the Site.

Pursuant to 20.6.2.4110 NMAC, approval of this Plan does not relieve Nutrien from the obligation to conduct all investigation, abatement, monitoring, and reporting according to the terms and schedules contained in the approved S2AP nor does it relieve Nutrien of the responsibility to obtain third-party access or to comply with any other applicable federal, state and/or local laws and regulations, including zoning requirements and nuisance ordinances. Furthermore, it is Nutrien's responsibility to maintain compliance with the requirements or conditions of any other part or parts of the approved S2AP not covered by the activities specified above. If monitoring data or other information indicate Site abatement is ineffective or is creating unreasonable injury to health, welfare, environment, or property, NMED may require additional modification of the S2AP pursuant to 20.6.2.4111.B NMAC. Any additional modification of the S2AP must receive prior approval in writing from NMED.

NMED is taking all necessary precautions to reduce the spread of COVID-19. Given the current public health emergency, all S2AP activities must by conducted in accordance with the Governor's current Executive Orders and Public Health Orders. Please help to keep New Mexicans safe by visiting the New Mexico Department of Health's website (cv.nmhealth.org) to learn how you can play a role in stopping the spread of COVID-19. If you believe the current COVID-19 restrictions impact your ability to safely complete one or more required S2AP tasks in accordance with the updated S2AP schedule, please contact one of the GWQB employees listed below.

If you have any questions, please contact Paul Chamberlain, State Cleanup Program Project Manager at paul.chamberlain@state.nm.us or Justin Ball, State Cleanup Program Team Leader at 505-222-9522 or justin.ball@state.nm.us. Thank you for your cooperation in this matter.

Sincerely,

Michelle Hunter, Chief Ground Water Quality Bureau

Cc: Todd Leonard, Rubik, <u>TLeonard@rubikenv.com</u>
Steve Meninger, Rubik, <u>SMeninger@rubikenv.com</u>
Justin Ball, NMED ROS-SCP
Paul Chamberlain, NMED ROS-SCP
ROS Reading File